

WHAT IS CLAIMED:

1. A method for increasing the production capacity of wells that contain oil, gas and/or water well defined because mechanical vibrations are introduced in the well bore region to produce shear vibrations in the well bore region due to displacement of phase of mechanical vibrations produced along the axis of the well, achieving alternately tension and pressure by superposition of longitudinal and shear waves, thereby stimulating the occurrences of mass transference processes within said well.
2. A method of claim 1, well defined because the superposition of longitudinal and shear waves conform an acoustic flow with speed U_T and wavelength $\lambda/4$.
3. Electro acoustic device for increasing the production capacity of wells that contain oil, gas and/or water by introducing mechanical waves in the well bore region of said wells, well defined because it comprises a sonotrode whose irradiation surface is developed along the axis of the well, whose length must not be less than half the wavelength generated, producing shear vibrations in the well bore region due to displacement of phase of mechanical vibrations produced along the axis of the well, achieving alternately tension and pressure due to the superposition of the longitudinal and shear waves, and stimulating in this way the occurrences of mass transference processes within said wells.

4. Electro acoustic device of claim 3, well defined because said superposition of longitudinal and shear waves conform an acoustic flow with speed U_f and wavelength $\lambda/4$.
- 5 5. Electro acoustic device of claim 4, well defined because said sonotrode has a tubular geometric shape with an external diameter D_0 whose nearer end has the shape of a horn and its further end the shape of a hemisphere with an external diameter $D_0/2$.
- 10 6. Electro acoustic device of claim 5, well defined because the dimensions of said tubular geometric shape are determined by the operating conditions under resonance parameters of longitudinal and radial vibrations in the natural resonance frequency of an electro acoustic transducer contained in said electro acoustic device.
- 15 7. Electro acoustic device of claim 6, well defined because said electro acoustic transducer is of the magnetostrictive type.
8. Electro acoustic device of claim 6, well defined because said electro acoustic
20 transducer is of the piezoelectric type.
9. Electro acoustic device of previous claims, well defined because it comprises 2 or more electro acoustic transducers forming vibratory systems operating in phase,

connected to said sonotrode at distances that are multiples of half the wavelength of longitudinal and radial waves generated.

10. Electro acoustic device of claim 9, well defined because it comprises $2n$ vibratory systems, which when grouped into consecutive pairs, the electro acoustic transducers of each pair of vibratory system operate in phase, and every next pair operates in antiphase with regard to the one before.
11. Electro acoustic device of claim 10, well defined because n is a whole number.
12. Electro acoustic device of claim 5, well defined because said sonotrode comprises 2 or more grooves in its generatrix.
13. Electro acoustic device of claim 12, well defined because said grooves are placed parallel to the longitudinal axis of said sonotrode and have a length that is a multiple of half the wavelength generated and whose width is in the range of approximately $0.3D_0$ to $1.5D_0$.
14. Electro acoustic device of claim 13, well defined because the dimensions of said tubular geometric shape are determined by working conditions under resonance parameters of radial and longitudinal vibrations in the natural frequency of resonance of an electro acoustic transducer contained in said electro acoustic device.

15. Electro acoustic device of claim 14, well defined because said electro acoustic transducer is of the magnetostrictive type.
- 5 16. Electro acoustic device of claim 14, well defined because said electro acoustic transducer is of the piezoelectric type.
- 10 17. Electro acoustic device of previous claims, well defined because it comprises 2 or more electro acoustic transducers, forming vibratory systems operating in phase connected to said sonotrode at distances that are multiples of half the wavelength of the longitudinal and radial waves generated.
- 15 18. Electro acoustic device of claim 17, well defined because it comprises $2n$ vibratory systems grouped in consecutive pairs, the electro acoustic transducers of each vibratory system operate in phase and each next pair operates in antiphase with respect to the previous one.
19. Electro acoustic device of claim 18, well defined because n is a whole number.